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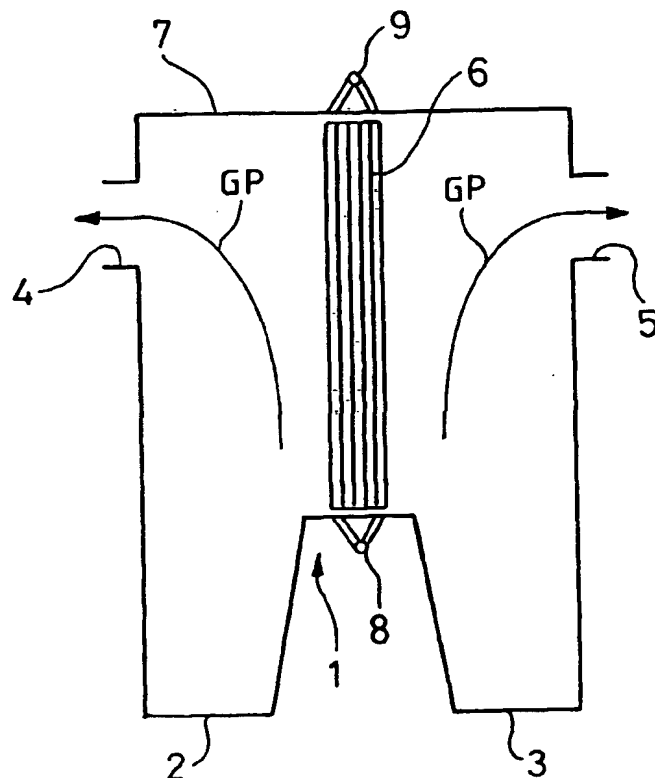
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(54) Title: FLUIDIZED BED BOILER FURNACE COMPRISING TWO HEARTHES SEPARATED BY AN INSIDE LEG AREA

(54) Titre : FOYER DE CHAUDIÈRE A LIT FLUIDISE COMPRENANT DEUX SOLES SÉPARÉES PAR UN ENTREJAMBE



(57) **Abstract:** The fluidized bed boiler furnace provided with two hearths (2,3) separated by an inside leg area (1) in the lower part of the furnace comprises one or several panels (6) of heat exchange pipes each of which is disposed vertically above the inside leg area of the furnace and perpendicularly in relation to the longitudinal direction (A) of said hearths.

(57) **Abrégé :** Le foyer de chaudière à lit fluidisé ayant deux soles (2,3) séparées par un entrejambe (1) à la partie inférieure du foyer comprend un ou plusieurs panneaux (6) de tubes d'échange de chaleur disposés chacun verticalement au dessus de l'entrejambe du foyer et perpendiculairement à la direction longitudinale (A) desdites soles.

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A FLUIDIZED BED BOILER FURNACE COMPRISING TWO HEARTHES  
SEPARATED BY A DIVIDER

The invention relates to a fluidized bed furnace  
comprising two hearths separated by a divider in the  
5 bottom portion of the furnace, and at least one panel of  
heat exchange tubes.

A furnace of the above-described kind for a  
circulating fluidized bed boiler is known, in particular  
from patent applications FR-91/03700 and FR-90/11859. It  
10 is known to install one or more panels of heat exchange  
tubes carrying a heat-conveying fluid such as water or an  
emulsion of water and steam inside a furnace of a  
fluidized bed boiler. Each panel of tubes is  
conventionally disposed perpendicularly to the side walls  
15 of the furnace, and is optionally fixed thereto.  
Nevertheless, for a furnace comprising two hearths  
separated by a divider, such a disposition suffers from  
the drawback of limiting the number of panels that can be  
installed on the side walls of the furnace without  
20 impeding circulation of particles towards the cyclones  
provided on said side walls.

The object of the invention is to propose another  
disposition of heat exchange tube panels that takes  
advantage of the structure of a furnace having a divider  
25 in its bottom portion.

The furnace for a fluidized bed boiler of the  
invention is characterized in that the panel of tubes is  
disposed vertically above said divider and  
perpendicularly to the longitudinal direction of said  
30 hearths. In this way, load balancing within the furnace  
is not impeded. A plurality of panels may be disposed in  
a row on top of the divider, being spaced apart regularly  
from one another in said longitudinal direction so as to  
leave sufficient space for particle circulation without  
35 creating pressure unbalances inside the furnace.

In a particular embodiment of the panel of the  
invention, the tubes forming a panel extend tubes forming

the divider, thereby avoiding the need to form feeds through the divider. A panel of the invention may also comprise alternating panels having tubes extending tubes forming the divider and panels having tubes which are  
5 connected to a manifold disposed within the divider. There will thus be panels fed by the fluid circulating in the walls of the furnace and panels fed with by the same fluid or with some other heat-conveying fluid.

Each panel of tubes is preferably fixed to the  
10 ceiling of the furnace so as to make it possible, if necessary, for the panel of tubes to be put under traction between the divider and the ceiling of the furnace so as to limit the vibration produced by the fluid circulating in the tubes of the panels.

15 There follows a description by way of example and with reference to the diagrammatic figures of the accompanying drawings of a furnace for a fluidized bed boiler of the invention.

Figure 1 is a very diagrammatic view of a furnace of  
20 the invention in longitudinal section showing a panel of tubes placed on the divider of the furnace.

Figure 2 is a highly diagrammatic plan view of the furnace showing the disposition of a plurality of panels of tubes on the divider of the furnace.

25 Figure 3 is a highly diagrammatic view showing how a panel of tubes is formed with tubes forming the divider of the furnace.

The furnace shown in Figure 1 is a furnace for a circulating fluidized bed (CFB) in which the bottom  
30 portion forms a divider 1 separating two hearths 2 and 3 of the furnace. The outlets from the furnace to cyclones are marked by references 4 and 5. The outlets to the cyclones are conventionally disposed on the side walls of the furnace, and a furnace having a divider may include  
35 four or more outlets to cyclones disposed on either side of the divider.

The furnace of the invention is fitted with at least one panel 6 of heat exchange tubes, which panel is disposed vertically on the top of the divider 1 and perpendicular to the longitudinal direction A of the hearths 2 and 3, so as to avoid impeding the circulation of gas and particles as represented by arrows GP, and so as to avoid setting up pressure unbalance within the furnace. Each panel 6 of heat exchange tubes is fixed to the ceiling 7 of the furnace and is put into traction between the ceiling and the divider to avoid unwanted vibration of the tubes in the panel when the furnace is in operation.

Figure 1 shows an inlet manifold 8 placed within the divider 1 and an outlet manifold 9 placed above the ceiling 7 of the furnace, with the tubes of the panel 6 being connected to the manifold.

As can be seen in Figure 2, a large number of panels 6 of tubes can be placed in a row on the top of the divider 1, being spaced apart regularly from one another along the divider 1.

The tubes forming the heat exchange panels 6 may extend tubes that form the divider of the furnace. It is also possible to have alternating panels 6 with tubes that extend tubes forming the divider of the furnace, and panels with tubes connected to the inlet manifold 8.

Figure 3 shows a panel 6A (seen from above) whose tubes extend tubes 11 forming the divider 1, and a panel 6B (seen from above) whose tubes 12 are connected to the inlet manifold 8 (not shown). Naturally, the configuration of the tubes forming the divider 1 and shown in Figure 3 is merely one non-limiting example of the invention. The disposition of the panels 6 of the invention is suitable both for a plane divider as shown in Figure 1 and for a divider in the form of an upside-down V-shape. Furthermore, in the example shown, the outlets 4, 5 to the cyclones are situated in the side

walls 13, 14; they could be situated in the transverse side walls 15 and 16.